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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KACKAR, RAM N

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/727,604

Applicant(s)

OH ET AL

Examiner

Ram N. Kackar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>none</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of claims 9-16 in the reply filed on 9/8/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 9-10, 13, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Angell et al (US 5288367).**

Angell et al disclose a plasma processing apparatus and optical emission spectrometer (Fig 1-45) attached to the plasma chamber on one side and to a computer for analyzing the light emitted from the plasma. Angell et al disclose collection of data for each emission source (wavelength of light for each species- abstract and Col 1 lines 65-Col 2 line 2) and storing it (Col 4 lines 24-30) and teach that data for a particular emission source (wavelength) is obtained by using reference data (weights) obtained by principal component analysis (multivariate analysis) of the stored data in advance to identify a channel which varies in such a manner that end point may be obtained by monitoring that channel (abstract) and later detecting end point on the basis of that variation.

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Regarding claim 13 using a duplicate database creating unit other than the computer attached to the spectrometer would only be duplication of parts.

Duplication of parts was held to have been obvious. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Harza* 124 USPQ 378 (CCPA 1960).

Claim 15 is an intended use limitation. However, Angell et al disclose that time trace of all channels could be observed (Col 6 line 63- Col 7 line 15). This trace would be able to monitor stability of the process condition.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 10-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Angell et al (US 5288367) in view of Christopher Webber (US Pub 2003/0055610).**

Angell et al disclose a plasma processing apparatus and optical emission spectrometer (Fig 1-45) attached to the plasma chamber on one side and to a computer for analyzing the light emitted from the plasma. Angell et al disclose collection of data for each emission source (wavelength of light for each species- abstract and Col 1 lines 65-Col 2 line 2) and storing it (Col 4 lines 24-30) and teach that data for a particular emission source (wavelength) is obtained by using reference data (weights) obtained by principal component analysis (multivariate analysis)

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of the stored data in advance to identify a channel which varies in such a manner that end point may be obtained by monitoring that channel (abstract) and later detecting end point on the basis of that variation.

Angell et al do not disclose that the multivariate analysis to create the reference database is an independent component analysis.

Christopher Webber discloses that independent component analysis provides blind signal separation without knowledge of or assumption concerning signal properties (Abstract and paragraph 02). Since it would be possible to separate the composite signal to species specific channels it would be advantageous to identify a channel which could indicate end point with greater certainty since independent component analysis is a non linear technique.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have alternatively used independent component analysis to identify a channel which varies in such a manner that end point may be obtained by monitoring that channel in order to detect endpoint with greater certainty.

**6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Angell et al (US 5288367) in view of Balasubramhanya et al (US 6521080).**

Angell et al disclose a plasma processing apparatus and optical emission spectrometer (Fig 1-45) attached to the plasma chamber on one side and to a computer for analyzing the light emitted from the plasma. Angell et al disclose collection of data for each emission source (wavelength of light for each species- abstract and Col 1 lines 65-Col 2 line 2) and storing it (Col 4 lines 24-30) and teach that data for a particular emission source (wavelength) is obtained by using reference data (weights) obtained by principal component analysis (multivariate analysis)

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of the stored data in advance to identify a channel which varies in such a manner that end point may be obtained by monitoring that channel (abstract) and later detecting end point on the basis of that variation.

Angell et al do not disclose that the quantitative data of each source (channel) could be set by inner product of the reference data and the emission spectrum in order for the quantitative data to provide the variability to detect process status like end point.

Balasubramhanya et al disclose the inner product of calibration principal component (reference data) and production principal component gives important clues to the process condition (abstract and Col 5 lines 51-65). For example (Fig 4A and Col 10 lines 28-38) the inner product changes sign at the end point to enable endpoint detection accurately.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to have alternatively used inner product of production principal component and calibration principal component to identify data variability in such a manner that end point may be detected with greater certainty.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ram Kackar  
Examiner AU 1763